

ABSTRACT OF THE DISCLOSURE

The present invention provides a method of manufacturing a semiconductor device capable of highly detailed patterning using a resist pattern having smoothed wall surfaces and reduced roughness. The method includes the steps of: forming a resist pattern over a base layer; applying a resist pattern smoothing material onto a surface of the resist pattern, thereafter heating and developing; and etching the base layer using the smoothed resist pattern, wherein one of an application thickness and a heat temperature is adjusted so as to smooth at least wall surfaces of the resist pattern. Aspects in which a maximum opening dimension and a minimum opening dimension of the smoothed resist pattern are $\pm 5\%$ of a predetermined opening dimension D (nm), and an average opening dimension D_{av} (nm) of the smoothed resist pattern satisfies $D_{av} \text{ (nm)} \geq D \text{ (nm)} \times (90/100)$, are preferable.